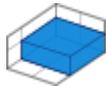


#02, M2S: RS232/422/485 port



Function: Universal RS232/422/485 port with electronic mode selection.

Form factor: [M2S](#)

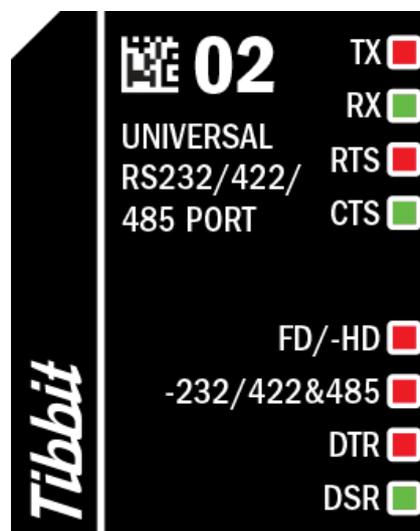
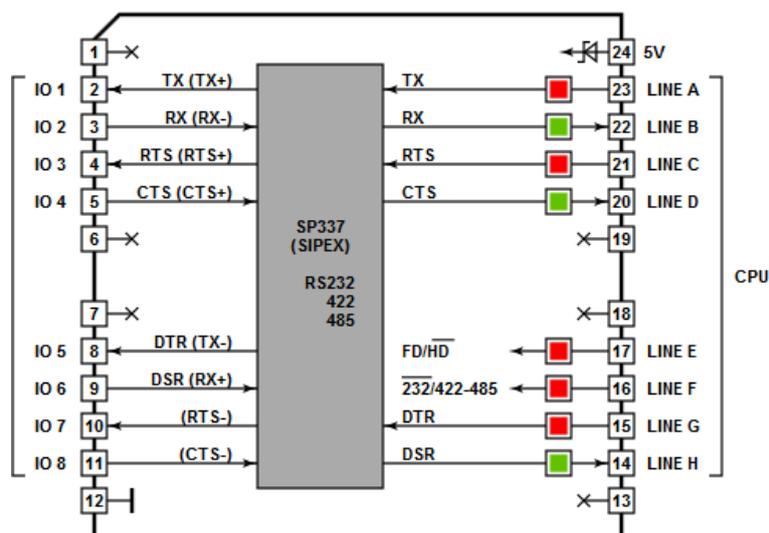
Category: Input/output module

Special needs: [\[SER\]](#), [\[INT\]](#).

Power requirements: 5V/[TBD](#)mA

Mates with: [#19](#), [#20](#)

See also: [#01](#), [#05](#)



Details

This is a "full" serial port that can be electronically programmed to work in RS232, RS422, or RS485 mode. The Tibbit is based on the Sipex SP337 universal transceiver.

Mode selection is through FD/HD and 232/422-485 control lines:

Mode	FD/-HD	-232/422-485
RS232	HIGH	LOW
RS422	HIGH	HIGH
RS485	LOW	HIGH

When unconnected, FD/-HD defaults to HIGH, while -232/422-485 defaults to LOW. This means that the RS232 mode will be selected.

In the RS232 mode the port has RX, TX, RTS, CTS, DTR, and DSR signals. This is the full-duplex mode.

In the RS422 mode the port has +/-RX, +/-TX, +/-RTS, and +/-CTS signal pairs. This is the full-duplex mode.

In the RS485 mode the port has only +/-RX and +/-TX signal pairs. This is the half-duplex mode, so you can connect +RX to +TX, and -RX to -TX. This will allow your system to communicate over a single twisted pair. Direction control is through the RTS line -- the line shall be LOW for data input and HIGH for output.

For "normal" RS232/422/485 applications, this Tibbit has to be connected to the TX and RX lines of the CPU's UART (see [\[SER\]](#)). Planning to use RTS/CTS flow control as well? An interrupt line must be available, too (see [\[INT\]](#)).

Combining this Tibbit with the "C" device [#19](#) (DB9M connector) will create a serial port with the following pin assignment on the DB9M:

	RS232	RS422	RS485
#1	<No connection>	TX2- (output, commonly RTS-)	<No connection>
#2	RX (input)	RX- (input)	RX- (input)
#3	TX (output)	TX+ (output)	TX+ (output)
#4	TX3 (output, commonly DTR)	TX- (output)	TX- (output)
#5	Ground	Ground	Ground
#6	RX3 (input, commonly DSR)	RX+ (input)	RX+ (input)
#7	TX2 (output, commonly RTS)	TX2+ (output, commonly RTS+)	<No connection>
#8	RX2 (input, commonly CTS)	RX2+ (input, commonly CTS+)	<No connection>
#9	<No connection>	RX2- (input, commonly CTS-)	<No connection>

The above pin assignment is the same we use on all our devices with the universal port (for example, see the [serial port of the DS1102](#)).

You can also combine the RS232 Tibbit with [#20](#) (9 terminal blocks).

LEDs

There are eight LEDs: five red and three green. Red LEDs are connected to TX, RTS, DTR, FD/-HD, and -232/422-485 lines. Green ones are for RX, CTS, and DSR. All LEDs are buffered (with logic gates) and light up for the LOW state of control lines.

Footprint and Color Coding



M2 Tibbits are double-width modules occupying [two "M" sockets on the standard tile](#). They are roughly 14 x 14 "squares" (one "square" is 2.54 x 2.54 mm).

With double the size comes the doubled internal space and I/O capacity. M2s have eight I/O lines. They are used for "grander things" that just wouldn't fit into the [M1 form factor](#).

Like M1s, M2 devices can be short (M2S) or tall (M2T).

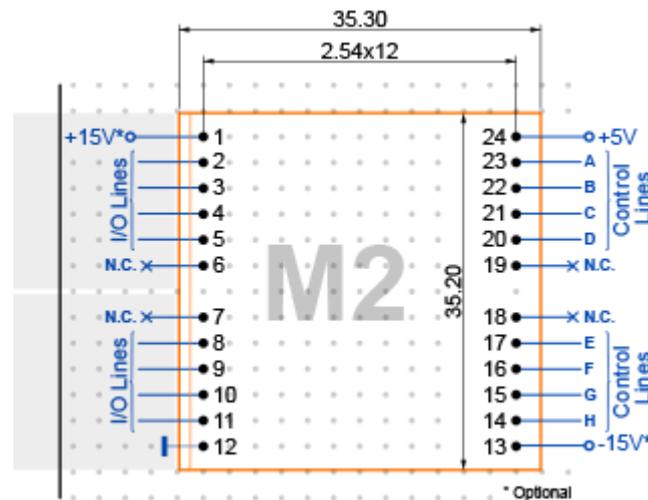
The color coding scheme is identical to that of M1 Tibbits:

				
Input module	Output module	Input/Output	Power supply	Blank module

M2 Tibbits can incorporate up to [eight status LEDs](#).

I/O pins

M2 modules have 4 groups of 6 pins arranged into 2 rows:



Pins 14-17 and 20-23 are control lines A-H. They are for interfacing to our [embedded modules](#) or other microcontrollers. On [Tibbo Project PCBs](#) these pins are connected to the main processor.

Pins 2-5 and 8-11 are I/O lines facing the outside world. On Tibbo Project PCBs they go to Tibbit connector sockets (i.e. connect to [C1](#) and [C2](#) devices).

Pins 12 and 24 are the GROUND and +5V power pins. Most Tibbit Modules consume (take) 5V power. There are also power supply Tibbits that generate 5V power from a variety of sources. Those *output* 5V through pin 12. As an example of power Tibbits see Tibbits [#10](#) and [#23](#).

Pins 1 and 13 are for the additional +15V and -15V voltages. These are optional and only needed by few Tibbits. A special power supply Tibbit [#12](#) generates +/-15V from the main 5V power.

Pins 6, 7, 18 and 19 are unused and should be left unconnected.

Notice that each pin row has a "missing pin" in this middle. This separates a row into two groups of 6 pins.